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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/773,524	YONEYAMA ET AL.	
	Examiner	Art Unit	
	Tsung-Yin Tsai	2609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *February 6, 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☒ Claim(s) *1-7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/6/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

(1) Page 1, lines 19 recited "an AF". The term "AF" has not been explains or extend what it means or what it stands for.

Appropriate correction is required.

2. The abstract of the disclosure is objected to because there are no transitional phrases, for example, "comprising", "consisting essentially of" and "consisting of" in the claims. The transition phrases "comprising", "consisting essentially of" and "consisting of" define the scope of claim with respect to what unrecited additional components or steps, if any, are excluded from the scope of the claims.

Correction is required. See MPEP § 608.01(b).

Claim Objections

3. Claim 1-7 are objected to because of the following informalities:

(1) Regarding claim 1, page 45 line 13, where cited "and a pattern image". Replace with – and the pattern image--.

Appropriate correction is required.

Claim Rejections – 35 USC 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over West et al (US Patent Number 4,496,971) in view of Xu et al (US Patent Number 5,761,336).

(1) Regarding claim 1:

West et al disclose the following:

an observation part changing unit (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on) changing an observation part (figure 1 disclose a observation part of interest that is map and grid for analysis) of an observation object (abstract, figure 3, column 1 lines 1-5 disclose the observation object to be a printed circuit) by driving a stage (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on, column 4 lines 45-50 disclose a stepping motor that operate to advance the table by 100um) on which the observation object is placed (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on which are presented for inspection), or an objective lens as opposed to the observation object;

a pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40

disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain) obtaining a pattern image (column 4 lines 22-67 disclose the apparatus on how the pattern is obtain, column 5 lines 1-10 disclose how the master pattern is obtain, column 6 lines 7-15 disclose that the establish reference values are obtain and apply) of a predetermined part (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze) by making said observation part changing unit (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on) drive the stage or the objective lens in order to change the observation part of the observation object to the predetermined part (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze) within the observation object (figure 1 disclose a observation part of interest that is map and grid for analysis), and by making said focusing controlling unit perform the focusing control according to the focusing control parameters set by said focusing control parameter setting unit in order to achieve focus on the predetermined part (figure 1 disclose a predetermined part in a grid pattern,

figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze);

a pattern image storing unit (column 4 lines 60-67 disclose software and hardware which is seen as the pattern image storage unit, column 10 lines 25-40 disclose where the pattern is upload from storage and shift between memory registers for computation and analysis) storing the pattern image obtained by said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain); and

a detecting unit (figure 3 part 33, column 2 lines 16-35 disclose a detecting unit for detecting anomalies of a pattern on a surface) detecting presence/absence of an abnormal condition of a part (column 1 lines 1-5, column 1 lines 22-40, column 2 lines 16-35 disclose detecting of abnormal condition of the object of interest from the surface) to be inspected by making a comparison between a pattern image (column 1 lines 10-15 disclose comparison between a taken image and a master image to detect abnormalities, column 5 lines 1-10 disclose comparing defect with master image pattern in area and perimeter, column 6 lines 7-10 disclose the master image with reference values of track

area and perimeters length for the master pattern), which is stored in said pattern image storing unit (column 4 lines 60-67 disclose software and hardware which is seen as the patter image storage unit, column 10 lines 25-40 disclose where the pattern is upload from storage and shift between memory registers for computation and analysis) and obtained by said pattern image obtaining unit (column 4 lines 60-67 disclose software and hardware which is seen as the patter image storage unit, column 10 lines 25-40 disclose where the pattern is upload from storage and shift between memory registers for computation and analysis), of a reference part determined to be normal beforehand within the observation object (column 5 lines 1-15 disclose that the master pattern data of parts are collected to be good quality, column 6 lines 7-11 disclose that the master pattern having establish reference values of track area and that other patterns will be grade according within those set reference values), and a pattern image, which is obtained by said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the pattern image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain), of the part to be inspected, which becomes a target of inspecting presence/absence of a defect within the observation object (column 4 lines 22-60 disclose how the image is taken and further analyze for faults where if a defect is determine it will

be ejected from the manufacturing line or be a target of further inspection by an human operator).

West et al does not teaching the following:

a focus direction driving unit driving at least one of the stage and the objective lens in order to achieve focus on the observation object placed on the stage;

a focusing controlling unit performing focusing control by making said focus direction driving unit drive at least one of the stage and the objective lens in order to achieve focus on the observation object;

a focusing control parameter setting unit setting focusing control parameters used for the focusing control performed by said focusing controlling unit

the focusing control parameters, which are used for the focusing control performed when said pattern image obtaining unit obtains the pattern image of the part to be inspected, are determined based on sample information obtained by the focusing control performed when said pattern image obtaining unit obtains the pattern image of the reference part.

However, Xu et al teaches regarding:

a focus direction driving unit driving at least one of the stage and the objective lens in order to achieve focus on the observation object placed on the stage (figure 1 disclose stage and stepping motor that move the stage for closer or better focus, column 4 lines 30-42 disclose how the stepper motor is the drive

focus unit for the aperture, column 5 lines 10-22 disclose appropriate aperture setting achieve by the stepper motor);

a focusing controlling unit performing focusing control by making said focus direction driving unit drive at least one of the stage and the objective lens in order to achieve focus on the observation object (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting);

a focusing control parameter setting unit setting focusing control parameters used for the focusing control performed by said focusing controlling unit (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform);

the focusing control parameters, which are used for the focusing control performed when said pattern image obtaining unit obtains the pattern image of the part to be inspected, are determined based on sample information (column 3 lines 4-10 disclose a calibration samples of the particular target to calibration data) obtained by the focusing control performed when said pattern image obtaining unit obtains the pattern image of the reference part.

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding the subject matter above. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(2) Regarding claim 2:

West et al teach regarding focusing control unit, pattern image obtaining unit obtains the pattern image of the part to be inspected and focusing control parameters.

West et al does not teach regarding focusing control parameter are changed to default values.

However, Xu et al further teaches focusing control parameter are changed to default values when focusing control is unsuccessful (column 3 lines 4-10 disclose where the operator provides a calibration samples of a target type to obtain calibration data which is seen as the default value, column 6 lines 23-65 disclose how the calibration data is use, column 6 lines 66-67 to column 7 lines 1-35 disclose the default parameters are use).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al to further teaching to West el at regarding default

values for focusing control parameter, such that this action will improve defect detection and characterization for many types of targets, thus for this reason the resolution is alter (column 5 lines 34-38, column 6 lines 66-67 to column 7 lines 1-10 discloses that is change to default values can also be from result of misalignment of the target sample and reference sample and focus of differences between the target sample and reference image, noise and normal process variations, where these values are stores in computer 105 for subsequent defect analysis of similar targets, which is seen as default values).

(3) Regarding claim 3:

West et al teaches regarding pattern image obtaining unit obtains the pattern image of the part to be inspected and focusing control parameters.

West et al does not teach regarding focusing control is unsuccessful performed as a result of causing the focusing control to be performed, a focusing position obtained by the focusing control performed when said pattern image obtaining unit obtains the pattern image of the reference part as a focusing position of the part to be inspected.

However, Xu et al teaches the following subject:

focusing control is unsuccessful performed as a result of causing the focusing control to be performed (column 3 lines 4-48 disclose the continuous actions made for successful focusing of the object of interest), a focusing position obtained by the focusing control performed (column 3 lines 4-48, column 4 lines 30-41, column 6 lines 10-22, column 6 lines 66-67 to column 7 lines 1-10) when

said pattern image obtaining unit obtains the pattern image of the reference part as a focusing position of the part to be inspected (column 3 lines 4-48, column 4 lines 30-41, column 6 lines 10-22, column 6 lines 66-67 to column 7 lines 1-10).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding the subject matter above. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(4) regarding claim 4:

West et al teach regarding pattern image obtaining unit, pattern image of the part, focusing position of the reference part of the focusing position of the part.

West et al does not teach regarding information about unsuccessful focusing control is added to the pattern image of the part to be inspected.

However, Xu et al further teaches regarding information about unsuccessful focusing control is added to the pattern image of the part to be inspected (column 1 lines 33-42 disclose a "defect map" stored in a computer, column 6 lines 66-68 to column 7 lines 1-10 disclose such data are stored in computer for subsequent defect analysis of similar target).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al to further teaching to West el at regarding information about unsuccessful focusing control is added to the pattern image of the part to be inspected, such that this action will improve defect detection and characterization for many types of targets, thus for this reason the resolution is alter (column 5 lines 34-38, column 6 lines 66-67 to column 7 lines 1-10 discloses that is change to default values can also be from result of misalignment of the target sample and reference sample and focus of differences between the target sample and reference image, noise and normal process variations, where these values are stores in computer 105 for subsequent defect analysis of similar targets, which is seen as default values).

(5) Regarding claim 5:

West et al disclose the following:

wherein said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain) comprises a reference pattern obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the pattern image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus

that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain) obtaining the pattern image (column 4 lines 22-67 disclose the apparatus on how the pattern is obtain, column 5 lines 1-10 disclose how the master pattern is obtain, column 6 lines 7-15 disclose that the establish reference values are obtain and apply) of the reference part by making said observation part changing unit drive the stage (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on, figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on, column 4 lines 45-50 disclose a stepping motor that operate to advance the table by 100um) or the objective lens in order to change the observation part of the observation object (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on which are presented for inspection) to the reference part determined to be normal beforehand within the observation object (column 5 lines 1-15 disclose that the master pattern data of parts are collected to be good quality, column 6 lines 7-11 disclose that the master pattern having establish reference values of track area and that other patterns will be grade according within those set reference values),

obtaining the pattern image of the part to be inspected by making said observation part changing unit drive the stage (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on, figure 1 disclose a observation part of interest that is map and grid for analysis, figure 3,

column 4 lines 23-40 disclose a movable platform that the object of interest is place on, column 4 lines 45-50 disclose a stepping motor that operate to advance the table by 100um) or the objective lens in order to change the observation part of the observation object to the part to be inspected, which becomes a target of inspecting presence/absence of a defect within the observation object (column 1 lines 1-5, column 1 lines 22-40, column 2 lines 16-35 disclose detecting of abnormal condition of the object of interest from the surface), and by making said

West et al does not teach the following:

making said focusing controlling unit perform the focusing control according to the focusing control parameters in order to achieve focus on the reference part according to the focusing control parameters set by said focusing control parameter setting unit, and

an inspection target pattern image obtaining unit,

focusing controlling unit perform the focusing control in order to achieve focus on the part to be inspected according to the focusing control parameters set by said focusing control parameter setting unit.

However, Xu et al teaches regarding the following:

by making said focusing controlling unit (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting) perform the focusing control according to the focusing control parameters (column 3 lines 4-10 disclose a calibration

samples of the particular target to calibration data) in order to achieve focus on the reference part according to the focusing control parameters set by said focusing control parameter setting unit (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform), and

an inspection target pattern image obtaining unit (column 2 lines 60-67 disclose the present invention that will optimize the image for different targets, but particularly target defect characterization);

focusing controlling unit (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting in order to achieve the focus for the part in interest) perform the focusing control in order to achieve focus on the part to be inspected according to the focusing control parameters set by said focusing control parameter setting unit (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al to further teaching to West el at regarding by making said focusing controlling unit perform the focusing control according to the focusing control parameters in order to achieve focus on the reference part according to the focusing control parameters set by said focusing control parameter setting unit, and an inspection target pattern image obtaining unit, focusing controlling unit perform the focusing control in order to achieve focus on the part to be inspected according to the focusing control parameters set by said focusing control parameter setting unit, such that this action will improve defect detection and characterization for many types of targets, thus for this reason the resolution is alter (column 5 lines 34-38, column 6 lines 66-67 to column 7 lines 1-10 discloses that is change to default values can also be from result of misalignment of the target sample and reference sample and focus of differences between the target sample and reference image, noise and normal process variations, where these values are stores in computer 105 for subsequent defect analysis of similar targets, which is seen as default values).

(6) Regarding claim 6:

West et al teaches all the subject matter above.

West et al does not teach regarding focusing control parameter, focusing control, reference pattern image obtaining unit, default values and inspection target pattern image obtaining unit.

However, Xu et al teaches regarding the following:

the focusing control parameters (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform) used for the focusing control (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting) performed when said reference pattern image obtaining unit obtains the pattern image of the reference part are focusing control parameters, which are default values (column 3 lines 4-10 disclose where the operator provides a calibration samples of a target type to obtain calibration data which is seen as the default value, column 6 lines 23-65 disclose how the calibration data is use, column 6 lines 66-67 to column 7 lines 1-35 disclose the default parameters are use); and

the focusing control parameters (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform) used for the focusing control (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling

unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting) performed when said inspection target pattern image obtaining unit (column 2 lines 60-67 disclose the present invention that will optimize the image for different targets, but particularly target defect characterization for further operator inspection) obtains the pattern image of the part to be inspected are focusing control parameters (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform) determined based on the sample information.

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al to further teaching to West el at focusing control parameter, focusing control, reference pattern image obtaining unit, default values and inspection target pattern image obtaining unit, such that this action will improve defect detection and characterization for many types of targets, thus for this reason the resolution is alter (column 5 lines 34-38, column 6 lines 66-67 to column 7 lines 1-10 discloses that is change to default values can also be from result of misalignment of the target sample and reference sample and focus of differences between the target sample and reference image, noise and normal process variations, where these values are stores in computer 105 for subsequent defect analysis of similar targets, which is seen as default values).

(7) Regarding claim 7:

West et al teaches all the subject matter above.

West et al does not teach regarding sample information, focusing position, reference part and information about a light amount according to the light reflection.

However, Xu et al teaches regarding the following:

wherein the sample information (column 3 lines 4-10 disclose a calibration samples which is analyze for calibration data regarding the pattern, column 6 lines 64-67 to column 7 lines 1-10 disclose that the sample information is upload to the computer for further analysis) is at least any of information about the focusing position (column 3 lines 33-45 showing that for calibration the aperture or focusing position for the most accurate defect detection) of the reference part (column 3 lines 4-10 discloses a calibration samples which is seen as the use for reference) and information about a light amount according to light reflected (column 3 lines 33-45 disclose that information is gather from the aperture diameter and light intensity that would result in the most accurate defect detection) from the reference part.

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teaching to West et al regarding sample information, focusing position, reference part and information about a light amount according to the light reflection, such that this action will improve defect detection and characterization for many types of targets, thus for this reason the resolution is

alter (column 5 lines 34-38, column 6 lines 66-67 to column 7 lines 1-10 discloses that is change to default values can also be from result of misalignment of the target sample and reference sample and focus of differences between the target sample and reference image, noise and normal process variations, where these values are stores in computer 105 for subsequent defect analysis of similar targets, which is seen as default values).

(8) Regarding claim 8:

West et al teaches the following:

a pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain) obtaining a pattern image (column 4 lines 22-67 disclose the apparatus on how the pattern is obtain, column 5 lines 1-10 disclose how the master pattern is obtain, column 6 lines 7-15 disclose that the establish reference values are obtain and apply) of a predetermined part (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze) by causing

an observation part of an observation object (figure 1 disclose a observation part of interest that is map and grid for analysis) to be changed to the predetermined part within the observation object (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze), and

a pattern image storing unit (column 4 lines 60-67 disclose software and hardware which is seen as the pattern image storage unit, column 10 lines 25-40 disclose where the pattern is upload from storage and shift between memory registers for computation and analysis) storing the pattern image obtained by said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain);

a detecting unit (figure 3 part 33, column 2 lines 16-35 disclose a detecting unit for detecting anomalies of a pattern on a surface) detecting presence/absence of an abnormal condition of a part (column 1 lines 1-5, column 1 lines 22-40, column 2 lines 16-35 disclose detecting of abnormal condition of the object of interest from the surface) to be inspected by making a comparison between a pattern image (column 1 lines 10-15 disclose comparison between a

taken image and a master image to detect abnormalities, column 5 lines 1-10 disclose comparing defect with master image pattern in area and perimeter, column 6 lines 7-10 disclose the master image with reference values of track area and perimeters length for the master pattern), which is stored in said pattern image storing unit (column 4 lines 60-67 disclose software and hardware which is seen as the patter image storage unit, column 10 lines 25-40 disclose where the pattern is upload from storage and shift between memory registers for computation and analysis) and obtained by said pattern image obtaining unit (column 4 lines 60-67 disclose software and hardware which is seen as the patter image storage unit, column 10 lines 25-40 disclose where the pattern is upload from storage and shift between memory registers for computation and analysis), of a reference part determined to be normal beforehand within the observation object (column 5 lines 1-15 disclose that the master pattern data of parts are collected to be good quality, column 6 lines 7-11 disclose that the master pattern having establish reference values of track area and that other patterns will be grade according within those set reference values), and a pattern image, which is obtained by said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the pattern image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain), of the

part to be inspected, which becomes a target of inspecting presence/absence of a defect within the observation object (figure 1 disclose the grid image of a part, figure 3 disclose the pattern image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain).

West et al does not teach the following:

focusing control to be performed in order to achieve focus on the predetermined part according to set focusing control parameters; and

the focusing control performed when said pattern image obtaining unit obtains the pattern image of the part to be inspected, are determined based on sample information obtained by focusing control performed when said pattern image obtaining unit obtains the pattern image of the reference part.

Xu et al teaches the following:

by causing focusing control (figure 1 disclose stage and stepping motor that move the stage for closer or better focus, column 4 lines 30-42 disclose how the stepper motor is the drive focus unit for the aperture, column 5 lines 10-22 disclose appropriate aperture setting achieve by the stepper motor) to be performed in order to achieve focus on the predetermined part according to set focusing control parameters (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105

has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform);

the focusing control parameters (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform), which are used for the focusing control performed when said pattern image obtaining unit obtains the pattern image of the part to be inspected, are determined based on sample information obtained by focusing control performed when said pattern image obtaining unit obtains the pattern image of the reference part (column 3 lines 4-10 disclose the focusing control obtain a calibration sample which is seen as the reference part, column 6 lines 65-67 to column 7 lines 1-39 disclose patterns of the inspected are inspected in comparison with the reference part and additional data are store in the computer for further analysis).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teaching to West et al regarding focusing control to be performed in order to achieve focus on the predetermined part according to set focusing control parameters and the focusing control performed when said pattern image obtaining unit obtains the pattern image of the part to be

inspected, are determined based on sample information obtained by focusing control performed when said pattern image obtaining unit obtains the pattern image of the reference part. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(9) Regarding claim 9:

West et al teaches the following:

driving a stage (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on, column 4 lines 45-50 disclose a stepping motor that operate to advance the table by 100um) or an objective lens as opposed to an observation object in order to change an observation part of the observation object placed on the stage (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on) to a reference part determined to be normal beforehand within the observation object (column 5 lines 1-15 disclose that the master pattern data of parts are collected to be good quality, column 6 lines 7-11 disclose that the master pattern having establish reference values of track area and that other patterns will be grade according within those set reference values);

obtaining a pattern image of the reference part (column 5 lines 1-15 disclose that the master pattern data of parts are collected to be good quality, column 6 lines 7-11 disclose that the master pattern having establish reference values of track area and that other patterns will be grade according within those set reference values);

driving the stage or the objective lens in order to change the observation part of the observation object to a part to be inspected, which becomes a target of inspecting presence/absence of a defect within the observation body (column 1 lines 1-5, column 1 lines 22-40, column 2 lines 16-35 disclose detecting of abnormal condition of the object of interest from the surface);

obtaining a pattern image of the part to be inspected (column 4 lines 22-67 disclose the apparatus on how the pattern is obtain, column 5 lines 1-10 disclose how the master pattern is obtain, column 6 lines 7-15 disclose that the establish reference values are obtain and apply); and

detecting presence/absence of an abnormal condition of the part (column 1 lines 1-5, column 1 lines 22-40, column 2 lines 16-35 disclose detecting of abnormal condition of the object of interest from the surface) to be inspected by making a comparison between the pattern image (column 1 lines 10-15 disclose comparison between a taken image and a master image to detect abnormalities, column 5 lines 1-10 disclose comparing defect with master image pattern in area and perimeter, column 6 lines 7-10 disclose the master image with reference values of track area and perimeters length for the master pattern) of the

reference part and the pattern image of the part to be inspected (column 1 lines 10-15 disclose comparison between a taken image and a master image to detect abnormalities, column 5 lines 1-10 disclose comparing defect with master image pattern in area and perimeter, column 6 lines 7-10 disclose the master image with reference values of track area and perimeters length for the master pattern).

West et al does not teach regarding the following:

performing focusing control so that focusing is achieved on the reference part according to a first focusing control parameter, determining a second focusing control parameter based on sample information obtained by the focusing control and performing the focusing control in order to achieve focus on the part to be inspected according to the second focusing control parameter

However, Xu et al teaches the following:

performing focusing control so that focusing is achieved on the reference part according to a first focusing control parameter ((figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting);

determining a second focusing control parameter based on sample information obtained by the focusing control (column 3 lines 21-32 disclose adjusting of the intensity of the light source up and down this is seen as the second focusing control parameter);

performing the focusing control in order to achieve focus on the part to be inspected according to the second focusing control parameter (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting, column 3 lines 21-32 disclose adjusting of the intensity of the light source up and down will make further parameter for comparison of the taken pattern to the reference pattern).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding performing focusing control so that focusing is achieved on the reference part according to a first focusing control parameter, determining a second focusing control parameter based on sample information obtained by the focusing control and performing the focusing control in order to achieve focus on the part to be inspected according to the second focusing control parameter. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(10) Regarding claim 10:

West et al teach all the subject matter above.

West et al does not teach regarding wherein if the focusing control is unsuccessfully performed as a result of performing the focusing control such that focusing is achieved on the part to be inspected according to the second focusing control parameter, the focusing control is performed so that focusing is achieved on the part to be inspected according to the first focusing control parameter.

However, Xu et al teaches regarding the following subject:

wherein if the focusing control is unsuccessfully (column 3 lines 4-10 disclose where the operator provides a calibration samples of a target type to obtain calibration data which is seen as the default value, column 6 lines 23-65 disclose how the calibration data is use, column 6 lines 66-67 to column 7 lines 1-35 disclose the default parameters are use) performed as a result of performing the focusing control such that focusing is achieved on the part to be inspected according to the second focusing control parameter (column 3 lines 22-32 disclose where the light intensity which is seen as the second focusing control parameter that will further provide true defects from false positives), the focusing control is performed so that focusing is achieved on the part to be inspected according to the first focusing control parameter (column 3 lines 22-32).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding wherein if the focusing control is unsuccessfully performed as a result of performing the focusing control such

that focusing is achieved on the part to be inspected according to the second focusing control parameter, the focusing control is performed so that focusing is achieved on the part to be inspected according to the first focusing control parameter. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(11) Regarding claim 11:

West et al teaches all the subject matter above.

West et al does not teach regarding wherein if the focusing control is unsuccessfully performed as a result of performing the focusing control such that the focusing is achieved on the part to be inspected according to the first focusing control parameter, the focusing position obtained by the focusing control performed for the part to be referenced is regarded as the focusing position of the part to be inspected, and the pattern image of the part to be inspected is obtained.

However, Xu et al teaches wherein if the focusing control is unsuccessfully (column 3 lines 4-20 disclose where disclose false positives are show by the result of defect information, column 6 lines 23-65 disclose how the calibration data is use, column 6 lines 66-67 to column 7 lines 1-35 disclose the default

parameters are use) performed as a result of performing the focusing control such that the focusing is achieved on the part to be inspected according to the first focusing control parameter (column 3 lines 33-43 disclose where an operator will further inspect and adjust for better focus), the focusing position obtained by the focusing control performed for the part to be referenced is regarded as the focusing position of the part to be inspected (column 3 lines 33-43 disclose that the operator will inspect the reference patter and the obtain patter by visual inspection and determine the best focusing position for the part of interest), and the pattern image of the part to be inspected is obtained (column 3 lines 4-43 show how these patterns are obtain).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding wherein if the focusing control is unsuccessfully performed as a result of performing the focusing control such that the focusing is achieved on the part to be inspected according to the first focusing control parameter, the focusing position obtained by the focusing control performed for the part to be referenced is regarded as the focusing position of the part to be inspected, and the pattern image of the part to be inspected is obtained. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2

lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(12) Regarding claim 12:

West et al teaches all the subject matter above.

West et al does not teach regarding wherein when the pattern image of the part to be inspected is obtained by regarding the focusing position of the reference part as the focusing position of the part to be inspected, information about unsuccessful focusing control is added to the pattern image of the part to be inspected.

However, Xu et al teaches the following:

wherein when the pattern image of the part to be inspected is obtained by regarding the focusing position of the reference part (column 3 lines 4-20 disclose the obtain image compare with reference image) as the focusing position of the part to be inspected (column 3 lines 10-33 disclose the focusing positions that are both taken and compare), information about unsuccessful focusing control is added to the pattern image of the part to be inspected (column 3 lines 33-47 disclose where the information will be use as a feedback to determine and further optimize the image to achieve the most accurate defect detection for the target type).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at wherein when the pattern image of the part to be inspected is obtained by regarding the focusing position

of the reference part as the focusing position of the part to be inspected, information about unsuccessful focusing control is added to the pattern image of the part to be inspected. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(13) Regarding claim 13:

West et al teaches regarding

an observation part changing unit (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on) changing an observation part (figure 1 disclose a observation part of interest that is map and grid for analysis) of an observation object (abstract, figure 3, column 1 lines 1-5 disclose the observation object to be a printed circuit) by driving a stage (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on, column 4 lines 45-50 disclose a stepping motor that operate to advance the table by 100um) on which the observation object is placed (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on which are presented for inspection), or an objective lens as opposed to the observation object;

a pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain) obtaining a pattern image (column 4 lines 22-67 disclose the apparatus on how the pattern is obtain, column 5 lines 1-10 disclose how the master pattern is obtain, column 6 lines 7-15 disclose that the establish reference values are obtain and apply) of a predetermined part (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze),

a pattern image storing unit (column 4 lines 60-67 disclose software and hardware which is seen as the pattern image storage unit, column 10 lines 25-40 disclose where the pattern is upload from storage and shift between memory registers for computation and analysis) storing the pattern image obtained by said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of

the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain); and

a detecting unit (figure 3 part 33, column 2 lines 16-35 disclose a detecting unit for detecting anomalies of a pattern on a surface) detecting presence/absence of an abnormal condition of a part (column 1 lines 1-5, column 1 lines 22-40, column 2 lines 16-35 disclose detecting of abnormal condition of the object of interest from the surface) to be inspected by making a comparison between a pattern image (column 1 lines 10-15 disclose comparison between a taken image and a master image to detect abnormalities, column 5 lines 1-10 disclose comparing defect with master image pattern in area and perimeter, column 6 lines 7-10 disclose the master image with reference values of track area and perimeters length for the master pattern), which is stored in said pattern image storing unit (column 4 lines 60-67 disclose software and hardware which is seen as the patter image storage unit, column 10 lines 25-40 disclose where the pattern is upload from storage and shift between memory registers for computation and analysis) and obtained by said pattern image obtaining unit (column 4 lines 60-67 disclose software and hardware which is seen as the patter image storage unit, column 10 lines 25-40 disclose where the pattern is upload from storage and shift between memory registers for computation and analysis), of a reference part determined to be normal beforehand within the observation object (column 5 lines 1-15 disclose that the master pattern data of parts are collected to be good quality, column 6 lines 7-11 disclose that the

master pattern having establish reference values of track area and that other patterns will be grade according within those set reference values), and a pattern image, which is obtained by said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the pattern image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain), of the part to be inspected, which becomes a target of inspecting presence/absence of a defect within the observation object (column 4 lines 22-60 disclose how the image is taken and further analyze for faults where if a defect is determine it will be ejected from the manufacturing line or be a target of further inspection by an human operator).

West et all does not teach regarding an illuminating unit illuminating an observation object, an illumination intensity controlling unit controlling an intensity of illumination made by said illuminating unit, an image capturing unit performing image capturing, and obtaining an image of the observation object, an image capturing controlling unit controlling any of exposure, a gain, and exposure and a gain when the image capturing is performed by said image capturing unit, a focus direction driving unit driving at least one of the stage and the objective lens in order to achieve focus on the observation object placed on the stage, a focusing controlling unit performing focusing control by making said focus direction driving

unit drive at least one of the stage and the objective lens in order to achieve focus on the observation object, and by making said focusing controlling unit perform the focusing control in order to achieve focus on the predetermined part.

However, Xu et al teaches the following:

an illuminating unit illuminating an observation object (figure 1, figure 2, column 3 lines 22-32 disclose a light source);

an illumination intensity controlling unit controlling an intensity of illumination made by said illuminating unit (column 3 lines 22-32 disclose the light source intensity to be turn up and down);

an image capturing unit performing image capturing, and obtaining an image of the observation object (column 1lines 64-67 to column 2 lines 42 disclose an imaging system);

an image capturing controlling unit controlling any of exposure, a gain, and exposure and a gain when the image capturing is performed by said image capturing unit (column 3 lines 10-45 the image capturing system able to capture and compare the varies values use for image capture and comparison);

a focus direction driving unit driving at least one of the stage and the objective lens in order to achieve focus on the observation object placed on the stage (figure 1 disclose stage and stepping motor that move the stage for closer or better focus, column 4 lines 30-42 disclose how the stepper motor is the drive focus unit for the aperture, column 5 lines 10-22 disclose appropriate aperture setting achieve by the stepper motor);

a focusing controlling unit performing focusing control by making said focus direction driving unit drive at least one of the stage and the objective lens in order to achieve focus on the observation object (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting);

and by making said focusing controlling unit perform the focusing control in order to achieve focus on the predetermined part (figure 1 disclose stage and stepping motor that move the stage for closer or better focus, column 4 lines 30-42 disclose how the stepper motor is the drive focus unit for the aperture, column 5 lines 10-22 disclose appropriate aperture setting achieve by the stepper motor);

any of said illumination controlling unit (column 3 lines 22-32 disclose lighting source that is adjustible), said image capturing controlling unit, said illuminating unit and said image capturing controlling unit is controlled so that brightness of the pattern image of the reference part (column 3 lines 22-33 disclose that the lighting source will enable the image capturing use to capture other data for image comparison and analysis), which is obtained by said pattern image obtaining unit, and brightness of the pattern image of the part to be inspected match or approximately match (column 3 lines 22-33 disclose that the light source is able to disclose data such as setting, location, outline and size of detected defect with the reference image for further comparison).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding the subject matter above. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(14) Regarding claim 14:

West et al teaches all the subject matter above.

West does not teach regarding a photodetecting unit detecting the illumination intensity, wherein said illumination controlling unit is controlled based on a result of detection made by said photodetecting unit so that the brightness of the pattern image of the reference part and the brightness of the pattern image of the part to be inspected, which are obtained by said pattern obtaining unit, match or approximately match.

However, Xu et al teaches regarding

a photodetecting unit detecting the illumination intensity (column 3 lines 40-45 disclose defining the aperture diameter/light intensity), wherein

said illumination controlling unit (column 3 lines 22-32 disclose the light source intensity to be turn up and down) is controlled based on a result of detection made by said photodetecting unit (column 3 lines 30-45 disclose the

operator changing the aperture and the light intensity) so that the brightness of the pattern image of the reference part and the brightness of the pattern image of the part to be inspected, which are obtained by said pattern obtaining unit, match or approximately match (column 3 lines 4-45 disclose that the brightness of the light intensity will further disclose detail for image comparison between the master and the obtain image).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding the subject matter above. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(15) Regarding claim 15:

West et al teaches the following subject matter:

said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain) obtains the pattern image

(column 4 lines 22-67 disclose the apparatus on how the pattern is obtain, column 5 lines 1-10 disclose how the master pattern is obtain, column 6 lines 7-15 disclose that the establish reference values are obtain and apply) of the predetermined part (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze) by making said observation part changing unit (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on) drive the stage or the objective lens in order to change the observation part of the observation object to the predetermined part (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze) within the observation object

performed when said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain) obtains the pattern image (column 4 lines 22-67 disclose the apparatus on how the pattern is obtain,

column 5 lines 1-10 disclose how the master pattern is obtain, column 6 lines 7-15 disclose that the establish reference values are obtain and apply) of the part to be inspected, are determined based on sample information obtained by the focusing control performed when said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain) obtains the pattern image of the reference part.

West et al does not teach regarding the following subject matter:

a focusing control parameter setting unit setting focusing control parameters used for the focusing control performed by said focusing controlling unit;

said focusing controlling unit perform the focusing control in order to achieve focus on the predetermined part according to the focusing control parameters set by said focusing control parameter setting unit;

the focusing control parameters, which are used for the focusing control;

pattern image of the reference part.

However, Xu et al teaches regarding:

a focusing control parameter setting unit (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where

the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform) setting focusing control parameters used for the focusing control performed by said focusing controlling unit (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting);

said focusing controlling unit (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting) perform the focusing control in order to achieve focus on the predetermined part according to the focusing control parameters (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform) set by said focusing control parameter setting unit (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus

control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform);

the focusing control parameters (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform), which are used for the focusing control (figure 1 disclose stage and stepping motor that move the stage for closer or better focus, column 4 lines 30-42 disclose how the stepper motor is the drive focus unit for the aperture, column 5 lines 10-22 disclose appropriate aperture setting achieve by the stepper motor);

pattern image of the reference part (column 3 lines 4-10 discloses a calibration samples which is seen as the use for reference).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding the subject matter above. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(16) Regarding claim 16:

West teaches the following subject matter:

said pattern image obtaining unit (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40 disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain) obtains the pattern image (column 4 lines 22-67 disclose the apparatus on how the pattern is obtain, column 5 lines 1-10 disclose how the master pattern is obtain, column 6 lines 7-15 disclose that the establish reference values are obtain and apply) of the predetermined part (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze) by making said observation part changing unit (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on) drive the stage or the objective lens in order to change the observation part of the observation object to the predetermined part (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze) within the

observation object (figure 1 disclose a observation part of interest that is map and grid for analysis),

the predetermined part (figure 1 disclose a predetermined part in a grid pattern, figure 2 disclose possible parts that does not fit the predetermine part pattern, figure 3 disclose part 31 and 32 that are predetermined pattern, column 2 lines 16-35 disclose part that has threshold values that are to be analyze).

West et al does not teach focusing control parameter setting unit, setting focusing control parameters, making said focusing controlling unit, perform the focusing control in order to achieve focus on the predetermined part according to the focusing control parameters set by said focusing control parameter setting unit.

However, Xu et al teaches the following subject matter:

a focusing control parameter setting unit (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform) setting focusing control parameters used for the focusing control performed by said focusing controlling unit (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting), wherein:

and by making said focusing controlling unit (figure 1 disclose stage and stepping motor that move the stage for closer or better focus, column 4 lines 30-42 disclose how the stepper motor is the drive focus unit for the aperture, column 5 lines 10-22 disclose appropriate aperture setting achieve by the stepper motor) perform the focusing control in order to achieve focus on the predetermined part according to the focusing control parameters set by said focusing control parameter setting unit (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform); and

the focusing control parameters (column 3 lines 4-48 disclose how the setting and parameter are achieve, column 4 lines 19-30 disclose where the computer 105 has a windowing user interface for user to set parameter setting for the focus control unit, column 6 lines 10-67 disclose the steps, parameters and calibrations for the focusing control parameter setting unit for the focusing control to perform), which are used for the focusing control (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting) performed when said pattern image obtaining unit obtains the pattern image of the part to be inspected, are

determined based on sample information (column 3 lines 4-10 disclose a calibration samples of the particular target to calibration data) obtained by the focusing control performed when said pattern image obtaining unit obtains the pattern image of the reference part.

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding focusing control parameter setting unit, setting focusing control parameters, making said focusing controlling unit, perform the focusing control in order to achieve focus on the predetermined part according to the focusing control parameters set by said focusing control parameter setting unit. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

(17) Regarding claim 17:

West et al teaches the following subject matter:

driving a stage (figure 3, column 4 lines 23-40 disclose a movable platform that the object of interest is place on, column 4 lines 45-50 disclose a stepping motor that operate to advance the table by 100um) or an objective lens as opposed to an observation object in order to change an observation part of the observation object placed on the stage (figure 3, column 4 lines 23-40 disclose a

movable platform that the object of interest is place on) to a reference part determined to be normal beforehand within the observation object (column 5 lines 1-15 disclose that the master pattern data of parts are collected to be good quality, column 6 lines 7-11 disclose that the master pattern having establish reference values of track area and that other patterns will be grade according within those set reference values);

detecting presence/absence of an abnormal condition of the part (column 1 lines 1-5, column 1 lines 22-40, column 2 lines 16-35 disclose detecting of abnormal condition of the object of interest from the surface) to be inspected by making a comparison between the pattern image (column 1 lines 10-15 disclose comparison between a taken image and a master image to detect abnormalities, column 5 lines 1-10 disclose comparing defect with master image pattern in area and perimeter, column 6 lines 7-10 disclose the master image with reference values of track area and perimeters length for the master pattern) of the reference part and the pattern image of the part to be inspected (column 1 lines 10-15 disclose comparison between a taken image and a master image to detect abnormalities, column 5 lines 1-10 disclose comparing defect with master image pattern in area and perimeter, column 6 lines 7-10 disclose the master image with reference values of track area and perimeters length for the master pattern)

performing image capturing (figure 1 disclose the grid image of a part, figure 3 disclose the patter image obtaining unit 33, column 1 disclose an apparatus for detection of anomalies in printed circuits, column 1 lines 22-40

disclose the an apparatus that has sensitive detecting means relating to respective features of the pattern, column 2 lines 15-25, column 4 lines 22-67 disclose the apparatus on how the pattern is obtain), and obtaining a pattern image of the reference part (column 5 lines 1-15 disclose that the master pattern data of parts are collected to be good quality, column 6 lines 7-11 disclose that the master pattern having establish reference values of track area and that other patterns will be grade according within those set reference values); detecting presence/absence of an abnormal condition of the part (column 1 lines 1-5, column 1 lines 22-40, column 2 lines 16-35 disclose detecting of abnormal condition of the object of interest from the surface) to be inspected by making a comparison between the pattern image of the reference part and the pattern image of the part to be inspected (column 1 lines 10-15 disclose comparison between a taken image and a master image to detect abnormalities, column 5 lines 1-10 disclose comparing defect with master image pattern in area and perimeter, column 6 lines 7-10 disclose the master image with reference values of track area and perimeters length for the master pattern).

West et al does not teach the following subject matter:

performing focusing control in order to achieve focus on the reference part;

obtaining an intensity of illumination for the observation object;

obtaining exposure and a gain when the image capturing is performed;

driving the stage or the objective lens in order to change the observation part of the observation object to a part to be inspected, performing focusing control in order to achieve focus on the part to be inspected;

illuminating the observation object with a same illumination intensity as the obtained illumination intensity;

obtaining a pattern image of the part to be inspected by performing the image capturing with the same exposure and gain as the obtained exposure and gain.

However, Xu et al teaches the following:

performing focusing control so that focusing is achieved on the reference part according to a first focusing control parameter (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6 lines 10-22 disclose computer 105 that will select an appropriate aperture setting);

obtaining an intensity of illumination for the observation object (column 3 lines 40-45 disclose defining the aperture diameter/light intensity);

obtaining exposure and a gain when the image capturing is performed (column 3 lines 10-45 the image capturing system able to capture and compare the varies values use for image capture and comparison);

performing focusing control in order to achieve focus on the part to be inspected (figure 1 disclose the stepper motor 115 connected to the computer 105 which seen a the focusing controlling unit, column 4 lines 20-30, column 6

lines 10-22 disclose computer 105 that will select an appropriate aperture setting);

illuminating the observation object with a same illumination intensity as the obtained illumination intensity (column 3 lines 22-33 disclose that the lighting source will enable the image capturing use to capture other data for image comparison and analysis, column 3 lines 22-32 disclose the light source intensity to be turn up and down, figure 1, figure 2, column 3 lines 22-32 disclose a light source);

obtaining a pattern image of the part to be inspected by performing the image capturing with the same exposure and gain as the obtained exposure and gain (column 3 lines 10-45 the image capturing system able to capture and compare the varies values use for image capture and comparison).

It would have been obvious to one skill in the art at the time of the invention to employ Xu et al teachings to West el at regarding the subject matter above. The motivation to combine such that the abilities to adjust will optimize image resolution for different type of targets (column 2 lines 60-67), automated review stations reduce labor costs and provide improved consistency and accuracy over human operators (column 2 lines 5-10, column 2 lines 57-58), thus, therefore further improve defect detection and characterization for many type of targets (column 5 lines 34-38).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Werson (US Patent Number 4,51,807) disclose an optical inspection system.

Wihl et al (US Patent Number 4,532,650) disclose photomask inspection apparatus and method using corner comparator defect detection algorithm.

Mita et al (US Patent Number 4,547,895) disclose pattern inspection system.

Takagl et al (US Patent Number 5,801,965) disclose method and system for manufacturing semiconductor devices, and method and system for inspecting semiconductor devices.

Mizuno (US Patent Number 6,047,083) disclose method of and apparatus for patter inspection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tsung-Yin Tsai whose telephone number is (571) 270-1671. The examiner can normally be reached on Monday - Friday 8 am - 5 pm ESP.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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May 2, 2007

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